



**GOVERNMENT OF WEST BENGAL**  
**OFFICE OF THE EXECUTIVE ENGINEER, P.W.D, BARRACKPUR DIVISION**  
Mangal Pandey Uddyan, Gandhighat, Barrackpore,  
District – North 24 Pgs., Pin- 700120  
Email Address : [cebkpdiv@gmail.com](mailto:cebkpdiv@gmail.com)

**NOTICE INVITING QUOTATION**

Memo No.: 1016/T-9

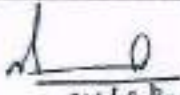
Date: 27-08-2024

**(N.I.O. No. 02 of 2024-25 Of Executive Engineer, PWD, Barrackpur Division)**

**Sealed quotations** are hereby invited from resourceful, bona fide, experienced, surveying and consulting engineering firms having credential in similar nature of works for carrying out the following jobs as detailed below:

1.	Name of Work	: Preparation of Geographic Information System (GIS) based Comprehensive Drainage Master Plan and Detailed Project Report along right side of Sodepur-Madhyamgram Road from Panihati Hospital near Sashibhusan High School, chainage 2.60 km to Muragacha More, chainage 4.85 km under Barrackpur Division, PWD, in the Dist. of North 24 Pgs. during the year 2024-25.
2.	Scope of work	: <b>As described in Appendix – A</b> The Consultant should use sophisticated machine/techniques/software for preparing the survey drawings. However, the consultant shall intimate about the methodology and survey equipments / software that will be operated during work.
3.	Eligibility	: i) Having experience in executing similar consultancy assignments for preparation of Master Plan/Detailed Project Report/Design and Engineering on Projects in the sector of Strom Water & Drainage in municipal towns/city/local panchyat within the last 5 (five) years. ii) Experience in similar nature of work under MORT&H, NHAI, State PWD & Other Govt. / Pvt. Organizations. iii) Adequate in house infrastructure support having experienced technical personnel/ equipments/ expertise/ software in carrying out similar nature of works. iv) Credentials/ Completion certificates from competent authority for similar nature of works, done during last 5( five) years to be submitted. v) Up-to-date clearance certificate of GSTN as applicable, S.T, I.T, P.T (as applicable). vi) Trade License of respective Municipality or Gram Panchayet.
4.	Site visit ( If necessary)	: Bidders are advised to submit their respective bids after visiting the sites and ascertaining for themselves the quantity of waste lying at site, site condition, location, surroundings, climate, applicable laws, applicable permits and regulations and any other matter considered relevant by them. Further examine for Strom water management practices, existing infrastructure and its surrounding and ascertain themselves on all technical and

		including carrying out necessary technical surveys, field investigation etc. at its own cost and risk. The bidders shall be responsible for all of the cost associated with the preparation of their bids and participation in the bidding process.
6.	Submission of quotation :	<p>Rates are to be offered in the form (included in <b>Appendix- B</b>) in the company's letterhead in sealed cover in <b>Lump-sum basis</b>. Rates are to be written both in figure and in words. The rates are required to be comprehensive covering all charges for manning, instruments &amp; appliances, carriage, stationeries &amp; other incidentals including all statutory taxes. Conditional offer will not be accepted.</p> <p>Rates are to be offered considering all aspect for submission of DPR with inter alia work, design, drawing, simulation with Sewer gem software, surveying of influence zone with total station, mapping and all other expenditure including taxes and duties as applicable.</p> <p>Copy of documents as noted at Sl. No. 3 (Eligibility) from (i) to (iv) are to be submitted along with offer letter. Copy of this NIQ along with Appendix –A duly signed by quotationer is required to be submitted during submission of quotation. Copy of NIQ may be downloaded / obtained from this office free of cost.</p> <p>Final acceptance of the bid shall however rest with the tender accepting authority subject to complying of the conditions as aforesaid.</p>
7.	Last date of submission :	<b>09/09/2024 up-to 2.00 pm in the drop box at the office of Executive Engineer, P.W.D. Barrackpur Division.</b>
8.	Opening of quotation :	<b>09/09/2024 at 3.00 pm.</b> It is advisable that the applicants remain present during opening.
9.	Execution of Tender/ Program of works :	Work order will be issued to the successful agency. Formal Tender agreement in appropriate form [WBF No.2911(i)/(ii)] will be available on requisite payment as per Govt. rules.
10.	Earnest Money :	2% of the quoted amount is required to be deposited in the form of Bank Draft issued by any Nationalized Bank in favour of Executive Engineer, P.W.D. Barrackpur Division, Government of West Bengal, at the time of formal tender.
11.	Security Deposit :	10% of the quoted amount. The SD will be released after 3 (three) months of successful completion of work.
12.	Time of Completion :	<b>7(Seven) days</b> from the date of commencement of work which will be specified in Work Order.

  
 27/8/24  
 Executive Engineer, P.W.  
 Barrackpur Division



Memo No. 1016/T-9/1(3)

Date : 27.08.2024

Copy Forwarded to :

1. The District Magistrate North 24 Parganas, Barasat for favour of his kind information
2. The Additional District Magistrate (General), North 24 Parganas, Barasat for favour of his kind information.
3. Sub Divisional Officer, Barrackpur for favour of his kind information.



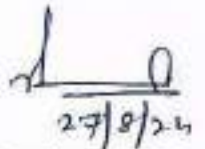
Executive Engineer, PWD  
Barrackpur Division

Memo No. 1016/T-9/2(10)

Date : 27.08.2024

Copy Forwarded to :

1. The Chief Engineer, Head Quarter, Nabanna, 8th floor, 325, Sarat Chatterjee Road, Shibpur for favour of his kind information.
2. The Chief Engineer, South Zone, Writers' Building, Kolkata-700001 for favour of his kind information.
3. The Superintending Engineer, (P.W.D) Eastern Circle- for favour of his kind information.
4. The Executive Engineer, Kolkata North Division/ Barasat Division for information and wide circulation.
5. The Assistant Engineer, P.W.D. Barrackpur Sub-Divn.No :- I/II / III for information and wide circulation.
6. Estimating Section / Accounts Section / Notice Board of this Office.
7. PWD Website



27/8/24

Executive Engineer, PWD  
Barrackpur Division

# **APPENDIX-A**

**(N.I.O. No. 02 of 2024-25 Of Executive Engineer, PWD, Barrackpur Division)**

**Name of Work:** "Preparation of Geographic Information System (GIS) based Comprehensive Drainage Master Plan and Detailed Project Report along right side of Sodepur-Madhyamgram Road from Panihati Hospital near Sashibhusan High School, chainage 2.60 km to Muragacha More, chainage 4.85 km under Barrackpur Division, PWD, in the Dist. of North 24 Pgs. during the year 2024-25. "

1. Location of the Work :- Sodepur-Madhyamgram Road along right side from Panihati Hospital near Sashibhusan High School, chainage 2.60 km to Muragacha More, chainage 4.85 km in the district of North 24 Paragans.

2. **Project Information**

Predominantly storm water drain with allied works keeping relevance with the existing municipal / panchayat drainage system and KMDA proposed master plan.

3. **Objective**

**The main objectives of the present work are:**

To prepare a GIS based comprehensive Drainage Master Plan and Detailed Project Report for implementation of comprehensive storm water drainage system within Sodepur-Madhyamgram Road right side from Panihati Hospital near Sashibhusan High School, chainage 2.60 km to Muragacha More, chainage 4.85 km so as to solve water logging problem of the area. The entire study will have an integrated approach to Urban and rural Watershed Management.

4. **Description of the Assignment**

a) The major components of the assignment are:

(i) **Preparation of Drainage Master Plan:** Preparation of GIS based Comprehensive Drainage Master Plan with DPR for Sodepur-Madhyamgram Road right side from Panihati Hospital near Sashibhusan High School, chainage 2.60 km to Muragacha More, chainage 4.85 km area which includes identification of problems, projected requirements, Rainfall analysis, Catchment area demarcation, sub-basin area development, flood routing by HEC-RAS software, Flood modelling with SWMM, development strategy and draft proposals on the GIS based map and zone-wise data analysis, to be done by the Consultant. The deliverables in the form of base map, data analysis reports, draft plan document, designs, diagrams, cost escalation etc.

(ii) **Spatial Attribute Collection & Vetting of Base Maps:** The consultant shall collect the base map from the department and incorporate necessary attribute. The draft base maps prepared by incorporating the attributes collected by the consultants on GIS database and draft final base maps generated shall be presented to the Nodal Officer of the department for vetting before proceeding for formulation of Master Plan. The final maps generated and approved by the department shall only be used as an input for further plan formulation.



- (iii) Base Map for the required municipal area shall be provided by the employer. Further base map/GIS database, if required, shall be collected by the consultant.
- (iv) **Database Creation:** Necessary field survey shall be done by the consultant in order to collect the data of existing storm water drainage and sewerage infrastructure and shall be incorporated in GIS map in different layers. Zone-wise data collection and data analysis report physical aspects is to be done by the Consultant. In addition, primary surveys such as existing drainage system, natural drainage system, catchment area, land slide area, problem areas, existing storm water drainage etc. are required to be undertaken as required and incorporated in GIS Data Base.

Catchment basin design shall be done using Digital Elevation Model (DEM). DEM needs to be developed by the consultant and grid shall be 25 m. A typical list of layers is given in Appendix. Consultant shall judiciously select the layers.

Integrated modelling of the catchment with urban drainage system and outfall khals / canals has to be done. The outfalls and the canals/khals should be modelled together.

**b. Scope of Services**

The consultant shall prepare GIS based Comprehensive Drainage Master Plan with Horizon year 2055 in order address long term goal. The consultant also shall suggest short-term measure and mid-term measure to address the water logging problem of the area so that immediate relief may be given to the residents of aforesaid Municipal area. The Master Plan and DPR shall be prepared as per guideline provided by the Government of India and Government of West Bengal.

The consultant shall study the outfall canals/khals carries storm water from both the municipalities upto the outfall at the proposed pumping station being developed by KMDA at Muragacha more for water logging mitigation. Consultant shall design the drainage system based on catchment basin, sub basin concept. Thus consultant shall decide study area considering above design concept.

**5. The scope of services to be rendered are as follows:**

- a) Study of Rainfall data and Hydrology for aforesaid Municipal/ Block area including analysis of historical data & future projected data. Preparation of IDF curve and calculation of storm water flow. Computer model shall be used for studying the urban flood routing and hydrology of the city.
- b) Study of outfall khals/canals leading to the final outfall at river. Existing situation, its hydraulic capacity, re-sectioning plan if necessary.
- c) Study of existing water body like pond, lake etc. and its rejuvenation plan to integrate with storm water management plan.

topo sheets and aerial photographs of town & the drainage basin (catchment area) and by carrying out additional survey.

- e) Topographical survey and mapping of entire project area with 0.25metre contour interval marking therein all-important features in GIS platform.
- f) Identification of flood prone areas, reasons for flooding and mitigation Measures required.
- g) Conducting field survey of existing drainage network, condition assessment of existing drainage infrastructure including determination of present Manning's coefficient, hydraulic testing etc. to check the adequacy of size of drain, identification & classification of major and primary storm water drains.
- h) The consultant shall study the pollution level of outfall canals/khals etc. and suggest pollution abatement measure for outfall canals/khals directly discharging to river/water body. The water quality parameter shall be tested from NABL accredited laboratory. The consultant shall also study whether there is any interconnection between storm water drainage and sewer in the area and suggest remedial measure to abate pollution to the outfall drains. The consultant should survey to determine the actual number of such outfall drains and perform necessary testing (from NABL accredited/WBPCB approved laboratory) to ascertain the pollution level.
- i) The drainage design shall be climate resilient.
- j) Any other works required to be performed for flood mitigation and to resolve water logging of entire aforesaid Municipal area are also included in the scope of service.
- k) If catchment area of any outfall drainage channel leading to river/other outfall drain is beyond aforesaid Municipal Area, study of that shall also be included within the scope.

Survey and modeling of entire catchment basin leading to the outfall at river near Uttarbhag or any other river required to be done.

Based on survey data the consultant shall find out no. of such channels and subcatchment etc.

**6. The DPRs shall include the following:**

- ☛ Urban Local Body (ULB)/ GP specific detailed survey of all the drains (Kutchra or Pucca) and their flood plain areas.
- ☛ Review of existing conditions including incorporation of existing and present Drainage works in progress by other agencies.
- ☛ Deficiency analysis from hydraulic and structural point of view.
- ☛ Enlisting of obstructions, bottlenecks and encroachments.
- ☛ Rehabilitation plan.
- ☛ Socio-Environmental impact analysis.
- ☛ Estimation of flood discharge and Hydraulic design. Estimation and



- ☛ Soil Investigation.
- ☛ Structural design of drain cross-section depending on the availability of land.
- ☛ Detailed estimates with rate analysis based on current Schedule of Rates, Government of West Bengal, rate analysis for non-schedule Items etc.
- ☛ Preparation of detailed construction Drawings (Good For Construction drawings)with co-ordinates.
- ☛ Construction program to complete the execution within 3 years.
- ☛ Ground water recharging study, its effect and suitable suggestion for ground water recharge as integrated flood management.
- ☛ Preparation of land schedule and land plan for acquisition of private, Government and forest lands to develop the network and other infrastructure development.
- ☛ The Master Plan and DPR should be prepared as per standard guidelines and as per the norms of external aided funding agency.
  
- ☛ The DPR should be prepared and submitted system wise, i.e., one DPR should be prepared for municipality and panchayets. Main Drain including all its Secondary and Tertiary Drains in a holistic manner shall be clearly mentioned in the DPR.
- ☛ All the measures to prevent water logging issues in project area as per their action plan submitted.

#### 7. Data / Information Collection:

- ❖ The consultant is required to collect information regarding the existing situation of Storm Drainage and sewerage system from ULB, I&WD, KMDA and Panchayets. The consultants shall also collect the rainfall data from IMD.
- ❖ Collection of existing maps, studies, and other related documentation to obtain a better understanding of the town's Storm Water Drainage System & sewerage system prior to the start of field work. (The consultant will be provided with copies of any previous studies carried out, if available as well as other available records).
- ❖ The consultant shall interact with the ULB, I&WD, KMDA and Panchayets and obtain a better understanding of the existing scenario of the Storm Drainage and sewerage of project area and will also be able to identify the Storm Water Drainage concerns of the area and obtain copies of town maps. The consultant shall keep the authority informed on the progress of the task.

#### 8. Key Design Principle:

The consultant shall search for different design practice adopted for urban storm water management and establish best design principle to be adopted for the project and shall get approval by the authority. Some of the guidelines are given hereunder:

- ❖ Rehabilitation measures on the existing system shall also be given due consideration based



- ❖ Preventing encroachments on drain.
- ❖ Priority in flood prevention should be first – habitable and business area; second – roads and third – open areas (Conversely; drains fill flood first to open area, second roads third and flooding of habitable and business area should be totally avoided).
- ❖ Integrating drains with roads and other development plans.
- ❖ Development of time-rainfall intensity frequency curves with the historical data available for at least 40 - 50 years. Proven Computer model shall be used for hydrology analysis.
- ❖ Routing of major drains shall be compatible with the land available and the cost of acquiring land shall be considered (major drains routing may be proposed away from densely populated commercial areas as far as possible).
- ❖ Avoid any pumping requirements and regular maintenance operational costs while addressing the main drainage concerns.
- ❖ Longitudinal sections at 25 metre interval, cross section levels at every 3 metres including the obligatory points are to be taken and mapped where ground undulation varies sharply levels are to be taken & plotted at closer intervals so as to demarcate the ground profile clearly. Junction levels, double check bench marks where needed, establishment of Bench Marks with concrete pedestals and superimposing them on the contour map for the extended area also to be prepared by the Consultant with an interval of 0.20 metre contour. The BMs shall be approximately one per one Sq. Km to be located at important junctions and on permanent structures and such other land marks & well documented in an exclusive register. All the documentation will become the property of the Govt. of Orissa and the consultant have to hand over to the employer both in hard copy & soft copy form.
- ❖ Prepare plans showing the existing regime and all the above features to a suitable scale.
- ❖ Prepare micro level storm water network plan integrating with the major storm water drains.
- ❖ The Consultant shall submit their findings along with a proposed capital improvement Plan to the City.
- ❖ Develop a drainage model with suitable software for analysis of system capacity needs for existing and future development.
- ❖ The outputs and recommendations of the study shall be integrated with the state level initiatives, if any.
- ❖ The report shall contain the Consultant's recommendation for a City-wide capital improvement program. The Consultant shall prioritize the work to be performed, based upon the severity of the capacity deficiency, importance of the component in the total storm drain system, cost effectiveness, and other applicable criteria.
- ❖ Cost analysis: Cost estimates for implementation and the proposed staged development plan. Prepare project cost estimates including capital, operation and maintenance costs and carry out project financial analysis and economic analysis.
- ❖ Implementation planning including prioritization of work for short term, medium term and long-term goal.
- ❖ Outline costs for all the drains with phasing of works.
- ❖ Develop comprehensive and integrated drainage plans for the area detailing the selected options and how they integrate into the overall city drainage plan.
- ❖ O&M requirements: Present practices of operation and maintenance including type of tools and equipment available shall be analyzed and necessary alternate options including infrastructure required for effective O&M shall be suggested including institutional arrangements for strengthening the O&M system.
- ❖ Economic analysis of the project considering various modalities of funding including adopting PPP model.
- ❖ Water (storm and wastewater) Quality monitoring - Identify current and forecast future water quality requirements.
- ❖ Environmental Analysis: conduct simple strategic environmental assessment for the master plan.



- 4. Catchment boundaries and sub-boundaries for each drain shall be identified. The study shall encompass the whole catchment/ watershed identified and the drainage system including any area beyond the municipal boundary if happens to be within the catchment, survey of existing drainage network and data relating to water logging, surface and sub-soil conditions, groundwater levels, tanks spillways, storm water retention structures, pumping, etc. Survey shall include levels at maximum 25 metre intervals longitudinally and at high and low points covering all obligatory points along the proposed drains top and invert levels and sections of existing secondary or tertiary drains joining the proposed drains.
- 4. For the entire length of all the drains, determine the invert elevation, top of drain and propose cross-sectional flow area for each section of drain duly considering existing culverts/structures.
- 4. In flat terrain to check not only hydraulic capacity but also retention capacity of drains.
- 4. Identify opportunities/locations for storm water retention (possible to the minimum extent, if unavoidable) and infiltration within the drainage system.
- 4. Consider alternative routing for drains to avoid channeling large quantity of water through densely populated areas.

**10. Software to be Used:**

ARC-GIS / Q-GIS, HEC-RAS, SWMM, MIKE-21 for urban storm water management modelling and SEWERGEMS for storm water drainage design. Latest version shall be used for the project having valid license from respective authority.

**11. Project Outcome and Deliverables:**

By the completion of this task KMDA/ UDMA shall have:

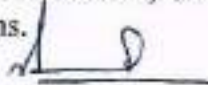
- ❖ An accurate assessment and understanding of the Storm water drainage system as well as water bodies like ponds and lakes etc. in GIS platform in the form of shape file.
- ❖ A complete and comprehensive storm water drainage master plan with DPR with the study report for the entire area up to design period showing complete details like drain size, material, slope, depth, invert levels, and all hydraulic details etc in GIS database.
- ❖ Contour map indicating 0.25 meter contour interval with junction levels, Bench marks covering the entire area @ one per sq.km at suitable locations in layers in GIS map and at field as well.
- ❖ Intensity duration curves and runoff coefficients.
- ❖ Flow charts: preliminary designs, drawings, and detailed cost estimates for drainage works until final disposal for the entire drainage.

- ❖ Implementation plan with phasing of works and standard type designs and plans.
- ❖ Short-, Mid- and long-term strategy to solve the problem.
- ❖ Increased awareness of staffs towards drainage issues.
- ❖ Institutional, financial, IRR, EIA etc. as per standard guidelines.
- ❖ The DPR for the work should be consist of Catchment area, drainage basin and sub basin etc. DPR for Outfall canals/khals upto river outfall in a holistic manner with detail Planning Design Drawing and Cost Estimate at the prevailing Schedule of Rates of Government of West Bengal.  
Modeling and drainage design may be done based on catchment, but estimate, DPR etc. shall have to be prepared as above.
- ❖ Detailed drawing i.e., longitudinal section, cross-section etc. of all infrastructure to be developed as well as existing infrastructure in AUTOCAD format and GIS format.
- ❖ Preparation of Bid Document as per guideline of External Funding Agency.
- ❖ All deliverables shall be submitted in GIS data base in different layers as far as possible.
- ❖ Social issues: Conducting public consultations with key stakeholders for the development of the integrated water master plan and contribute to workshops, seminars, and reports.

## 12. Reports to PW Dept.

Consultant shall submit followings Report to Executive Engineer, P.W.D., Barrackpur Division.

- i) Detailed Project Report with submission of PPT presentation–
  - **Main Report:** This report will represent the project background, details of survey and investigations, inferences, designs etc. broadly pertaining to Topographic Survey. Traffic studies, design of alignment and profile of road, pavement investigations and designs, investigations pertaining to bridges and culverts, design of new structures and rehabilitation of old structures, Drainage studies and design, recommendations and conclusions. Seven hard copies in colour print of drawing in A3/A2 size print and seven soft copies of DPR (including a copy in editable format) should be submitted in consultation with Executive Engineer, P.W.D, Barrackpur Division.
  - **Technical Specifications** – Unless other-wise required or proposed by Consultant, MORTH&H Specification for Road and Bridge Works (Latest) shall be adopted. However, in case of deviations from MORTH&H Specifications, Consultant shall have to enumerate in details under Special Specifications.

  
 Executive Engineer, P.W.D.  
 Barrackpur Division



## APPENDIX-B

(N.I.Q. No. 02 of 2024-25 Of Executive Engineer, PWD, Barrackpur Division)

**Bill of Quantity (B.O.Q) in connection with the work of "Preparation of Geographic Information System (GIS) based Comprehensive Drainage Master Plan and Detailed Project Report along right side of Sodepur-Madhyamgram Road from Panihati Hospital near Sashibhusan High School, chainage 2.60 km to Muragacha More, chainage 4.85 km under Barrackpur Division, PWD, in the Dist. of North 24 Pgs. during the year 2024-25."**

[To be filled up by the agency in letter head]

Sl No	Description of Items	Quantity	Unit	Rate	Amount (Rs.)
1.	Preparation of Geographic Information System (GIS) based Comprehensive Drainage Master Plan and Detailed Project Report along right side of Sodepur-Madhyamgram Road from Panihati Hospital near Sashibhusan High School, chainage 2.60 km to Muragacha More, chainage 4.85 km under Barrackpur Division, PWD, in the Dist. of North 24 Pgs. during the year 2024-25.	1 (One) Job	No.	Lump-Sum	
	Total Amount (Rs.)				

I/We agree to carry-out the work mentioned herein at the total cost of Rs.....(in figures) (Rupees.....)only abiding by all terms & conditions stipulated in N.I.Q. with full satisfaction of QIA.

